#2
9-27-01

THE PATENTS ACT,1970

It is hereby certified that hereto is a True Copy of the provisional Specification filed in respect of Patent Application No.542/MAS/2000,dated 13th July, 2000 by Amit Jaipuria and Pradeep Jaipuria, Indian residents,residing at 165A, 2nd Floor, R.M.V.Extension, 9th main road, Bangalore-560 080, India.....

..... In witness thereof
I have hereunto set my hand

Dated this the 21st day of March ,2001
30th day of Phalguna 1922(SAKA)

(S.CHANDRASEKARAN)

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FORM 1

THE PATENTS ACT, 1970
(39 of 1970)

APPLICATION FOR GRANT OF A PATENT

[See sections 5(2), 7, 54 and 135 and rule 33A]

1. Repeat the columns (a) to (c) if there are more than one applicant.
2. Insert the name in full. The family or principal name in the beginning if the applicant is a natural person.
3. Insert the complete address including postal index number/Code and State and/or country.
4. Insert the nationality.

1. I/We,
(a)[2] Amit Jaipuria
(b)[3] 165 A, 2nd Floor, R. M. V. Extension, 9th Main Road, Bangalore - 560 080, India
(c)[4] Indian

(a)[2] Pradeep Jaipuria
(b)[3] 165 A, 2nd Floor, R. M. V. Extension, 9th Main Road, Bangalore - 560 080, India
(c)[4] Indian

2. hereby declare:
(a) that ~~I am~~/we are in possession of an invention titled **"Method and apparatus for optimizing network potential using a secured system for an online community"**.
(b) That the Provisional/~~Complete~~ specification relating to this invention is filed with this application.
(c) That there is no lawful ground of objection to the grant of a patent to ~~me~~/us.

3. further declare that the inventor~~(s)~~ for the said invention is/~~are~~:[5]

(a)[6] Mr. Amit Jaipuria

(b)[7] 165 A, 2nd Floor
R. M. V. Extension, 9th Main Road
Bangalore – 560 080, India

(c)[8] Indian

~~4. I/We, claim the priority from the application(s) filed in convention countries, particulars of which are as follows:[9]~~
~~(a)[10]~~
~~(b)[11]~~
~~(c)[12]~~
~~(d)[13]~~
~~(e)[14]~~

5. Repeat the columns (a) to (c) if there are more than one inventor.
6. Insert the name in full. The family or principal name in the beginning.
7. Insert the complete address including postal index number/Code and State and/or country.
8. Insert the nationality.
9. Repeat the columns (a) to (e) if there are more than one applications.
10. Name of the country.
11. Application Number.
12. Date of application.

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Pradeep Jaipuria Amit Jaipuria

542 MAS 2000
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13. Applicant in convention country.

14. Title of the invention in the convention country.

15. Application number or patent number.

16. Date of application or date of patent.

17. Application number including published serial number, if any.

18. Date of filing of provisional specification and/or complete specification.

19. Complete address including postal index number/code and state along with telephone and telefacsimile number(s).

20. Repeat the columns (a) to (c) if necessary.

21. Signature of the true and first inventor(s) or applicant in the convention country with date. Name of the natural person should also be given below the signature.

5. I/We state that the said invention is an improvement in or modification of the invention, the particulars whereof are provided in the provisional specification attached herewith:
(a)[15] :- (particulars provided in provisional
(b)[16] specification attached)

~~6 I/We state that the application is divided out of my/our application, the particulars of which are given below and pray that this application deemed to have been filed on _____ under section 16 of the Act.~~
~~(a)[17]~~
~~(b)[18]~~

~~7. That I am/We are the assignee or legal representative of the true and first inventors.~~

8. That ~~my~~/our address for service in India is as follows:[19] Fox Mandal and Associates, 6/12, Primrose Road (Gurappa Avenue), Bangalore – 560 025.

~~9. Following declaration was given by the inventor(s) or applicant(s) in the convention country: I/We, the true and first inventor(s) for this invention or the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative: 20~~.

10 That to the best of ~~my~~/our knowledge, information and belief, the facts and matters stated herein are correct and that there is no lawful ground of objection to the grant of patent to ~~me~~/us on this application.

11 Following are the attachments with the application:
(a) Provisional ~~/Complete~~ Specification (3 copies).
(b) Drawings (3 copies)
~~(c) Priority document(s).~~
~~(d) Statement and Undertaking in Form 3.~~
(e) Power of authority.
~~(f) Declaration as to Inventorship in Form 5.~~
(g) Fee Rs. 1,500.00 in Cash ~~/ cheque/bank draft bearing No. 018058 dated 20th April 2000 on UTI Bank~~.

I/We request that a patent may be granted to ~~me~~/us for the said invention.

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Sudeep Gupta Amit Gupta

22. To be signed by the applicant(s) or if the applicant(s) is/are absent, by an authorised patent agent.

23. Name of the natural person who has signed.

Dated this 11th day of July 2000

Signature[22]

(Amit Jaipuria)[23]

(Pradeep Jaipuria)[23]

To
The Controller of Patent
B-Wing, II Floor
Rajaji Bhavan
Besant Nagar
Chennai – 600 090

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FORM 2

THE PATENTS ACT 1970

PROVISIONAL SPECIFICATION

542 MAS 2000

Method and apparatus for optimizing network potential using a secured system for an online community

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Indian

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ORIGINAL

The following specification particularly describes the nature of the invention and the manner in which it is to be performed.

Pradeep Jaipuria Amit Jaipuria

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A METHOD AND APPARATUS FOR OPTIMIZING NETWORKING POTENTIAL USING A SECURED SYSTEM FOR AN ONLINE COMMUNITY

Field of the invention

The present invention is a method and apparatus for optimizing networking potential using a secured system for an online community. The present invention will allow users "multiple bridges" of networking possibilities wherein a user could network with his friends (1st bridge) and their respective friends (2nd bridge) and so on (n bridges). This would optimize the user's online networking potential, as it would provide the user access to more than just his/her personal network. The present invention will also allow for different levels of access within the system whereby a user would control the extent of personal information including his/her own network that the user makes available to every other individual in his/her personal network. The method and apparatus of the present invention accordingly relate to personal and professional networking among an online community. This invention in effect optimizes networking among users.

Background of Invention

The following description traces the prior art, technology, method, system and problems associated with in respect of invented field. The objective of invention is to identify the problems associated with prior art, process and system and offer effective solution to over come the impediments associated with prior art.

There is a significant "human effort" involved in conventional networking that makes the process inefficient. By "human effort", we mean that individuals have to spend personal time and energy devising systems to keep track of their personal and professional networks. These systems could be telephone directories, business card directories, and etc. In this system, individuals do an internal analysis of a new contact and decide whether or not the individual is worth the "human effort" involved in adding to one's network system.

Second short come is that in the conventional system, individuals rarely use personal and professional networking together. By this we mean that an individual's relatives and their respective friends and colleagues are seldom kept track of in an individual's professional networking database. By tapping into these resources, one would increase his/her own networking potential.

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The third short come is that in the conventional system, individuals rarely use their friends from recreational and extra-curricular activities to professionally network. For example, consider one's peers in a recreational group such as a tennis club. Surely a few are networked with, but the "human effort" involved with keeping track of all if not most of them are very high. However these individuals may be a great source for potential networking if the "human effort" for adding them to one's personal networks could be minimized,

Finally, the fourth and possibly the major short come with the conventional system are that individuals do not have access to networks of their friends and colleagues. One may have his/her own networks documented but would rarely have an idea of his/her peers' networks. For example, John may know Eric because they went to college together, but he would have little if not no idea of the network that Eric has established for himself after college. If in some way, John had access to Eric's networks and vice versa, each would enhance the others networking potential. Obviously, this would raise privacy and security concerns but if addressed, would open up a whole new window to personal and professional networking.

In a nutshell, the system according to prior art has been inefficient so far because there has been a lack of a medium where such a system could be established. The medium would need an extensive database handling capability, global presence and user-friendliness during operation. The Internet came across as a medium where these three issues could be successfully addressed.

The Internet gave rise to several online communities on the World Wide Web offering users an opportunity to network with one another.

Today, there are networking sites that are aimed towards reviving lost contacts from academic institutions. These sites offer individuals an opportunity to sign up according to their school/college and class of graduation and allow users to update their personal and professional information for everyone who access the site to keep a track of.

There are other networking sites that are aimed towards family life. These sites encourage users to sign up and offer services that bring their family together. This could be through memory folders, chat sessions, family pictures, family tree etc. Their goal is to provide the audience with an opportunity to have their family online.

There are yet other networking sites that are aimed towards other topics of interest such as business, leisure and others where the audience is provided with an opportunity to chat and

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network based on their topic of interest. Some sites also provide their users bulletin boards and chat engines to post messages pertaining to their topic of interest.
As such there are sites involved with different aspects to networking but there is no one site that offers all possibilities of networking and offers a service that would bridge individuals to network among different interests. If a site would offer users an opportunity to network based on academic contacts, professional contacts, recreational contacts and personal family and friends, it would enhance every users networking potential by many folds.

A final point is that currently all sites offer what one calls a "1-bridge" networking opportunity for its users that is there is only 2 people involved in the networking. For example, Mark wishes to access a community site to check on his old friends from school. He needs to find a suitable site, sign up with it and individually network with each and every one of his friends. As such Mark will need to know every individual that he can network with. So, the networking lies between 2 individuals and hence connected by "1-bridge". There may be times where a friend in a site introduces Mark to another friend of his whereby there would be a "2-bridge networking" taking place. Even here, Mark would need to convey his need to the friend before his friend recommends anyone to Mark. But if there were a service that would allow Mark access to his friend's networks, it would optimize his personal networking potential.

By allowing individuals' access to each other's personal and professional networks (taking security measures into account), each individual would exponentially increase his/her potential to network.

Summary of the invention

In a preferred embodiment, the present invention provides a method and apparatus for users to search networks, both personal and their peers', all under the umbrella of a "multiple levels of access" security system. The present invention has been devised to optimize networking among users in a comprehensive online community.

In one embodiment where the present invention would be used, a user registers with the online community and personally adds individuals that he/she knows to his/her personal networking database. These individuals could be peers from academic institutions, professional life, recreational institutions or family members and friends. While adding these peers to one's list, the user grants a level of access to the individual peers. This is a security measure aimed to discourage solicitation from other unwanted online users. The levels of access give the user an opportunity to control the amount of personal information including

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contacts that he/she makes available to his/her individual peers. Based on the level of access granted by the user, the peer will or will not be able to access the user's information or the user's personal databases for potential networking.

It is also important to note that the level of access granted by 2 individuals need not be the same to each other. For example, consider "A" and "B". A may grant B access to his information but B may not grant An access to his information. The system will still work but when it comes to networking B will be able to search A's information but not vice versa. A case where such a security may be granted could be in the case where a student adds his/her professor to the student's personal network. In this case the student would have no problem in giving the professor access to his/her information and network since he/she has very little to lose but this may not be the same in the case of the professor where the professor may choose not to provide the student with his information and network.

In one embodiment of the invention there are **5 levels of access security system** provided, which could be used as described below.

Level 1: Public info (First name, Last name, Date of birth, City, State and Country of residence, masked email, Academic life summary including schools and colleges + degrees).

Level 2: Semi public information (Level 1 + Name and Contacts of businesses personally involved with present and past): User chooses to provide access to one's own professional information.

Level 3: Multi tier public information (Level 2 + Multi-bridge networking option): User chooses to provide access to one's own professional information and one's network.

Level 4: Semi private information (Level 2 + access to complete personal information): User chooses to provide access to one's own personal and professional information.

Level 5: Total information (Level 4 + multi-bridge networking option): User chooses to provide access to one's own personal and professional information including one's network.

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July 11, 2000

Level 1 would be the extent of information of online users available to the general public using the system. As one can note, potential benefits of networking would lie in levels 2 through 5, so another online user would not have any incentive to misuse the system using just a level 1 access.

The level of access granted by a user to a peer is the extent to which the peer can access the user's information or network. For example, if the user chose to grant a level 1, then the peer would not have access to the users professional information or the user's networks.

If the user granted a level 2 to his peer, the peer would only have access to the user's professional information, which would include his job profile along with his history of employment. The peer would not have access to the user's personal information such as family members, hobbies, etc.

If the user granted a level 4 to his peer he would in addition to information provided with a level 2 access would have available to him, the user's personal information including family, hobbies, etc.

If the user granted his peer a level 3 access, then the peer would have access to the user's networks and information available through a level 2 authorization.

Finally if the user granted his peer a level 5 access, then the peer would have access to the user's networks and information available through a level 4 authorization.

This would enhance the peers' networking capabilities and would enable him/her to network with friends of the user's that he may not necessarily know. However in order to get the detailed contact information of the user's friend, the peer would need to obtain it via the user. This would see to it that the user is aware that the peer is using his network and the user can choose to provide the details only if he/she so desires to do so.

While the above embodiment describes 5 levels of access to address the security of the system, those skilled in the art will realize that the functionality of the security system could be distributed over as many levels of access as required. Multiple levels of access will yield a more dynamic and flexible system, less prone to constraints in awarding access rights to user information and networks among online users.

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This five level access security system has been used throughout this document to illustrate examples and help the reader understand the need and uniqueness of the invention.

Networking among such a secured environment will allow users an opportunity to enhance their networking potential by expanding their networks to their peers' and beyond. It will also help establish credibility in the system and discourage other online users for example sales and marketing professionals from misusing the multi-bridge service.

In a preferred embodiment of the invention, the user (searcher) would connect with the central controller via an electronic network and log on using his/her "*userID*" and "*password*". The central controller would contain the database that would store user profiles along with individual network databases that would have the individual access levels granted to peers by users. The searcher would enter one or more network search fields based on the searchers choice for example company name, industry, department, etc. The central controller would receive the input data and pull up the searcher's personal network database from the user databases stored in the central controller. The controller would start the search using the searcher's personal network. The controller would as a first step search those individuals in the searcher's network that have given the searcher access to their information. This is the conventional "1-bridge" search. If any positive matches are made based on the search string(s), a list would be displayed and the searcher would be asked to verify continuation with the multi-bridge search. If the searcher wishes to have the multi-bridge search, the controller would search the searcher's personal database for those users that have granted the searcher access to their networks (assume these users to be "MB2 users"). The controller will then search the private networks of these MB2 users for other users that have granted them access to their information. Their information shall be subsequently searched and a list displaying the users that match the search string(s) will be displayed to the searcher as per the multi-bridge display. The Multi-Bridge display will be customized to avoid solicitation and will be displayed in a specific manner as shall be explained later. The searcher will then be asked to verify continuation with the multi-bridge search. If so, the controller will search the personal networks of MB2 users to identify those contacts that granted them access to their networks (assume these peers to be "MB3 users"). The controller will then search the private networks of these MB3 users for users that have granted them access to their information. A similar chain of commands will be carried on as to the MB2 search. Positive matches will be displayed according to the Multi-Bridge display and the searcher would have the option of continuing the search for as many bridges (MBn) as possible.

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It should be noted that in case a positive search was not made in the 1-bridge or a particular MBn search, the controller would automatically begin searching the next set of bridges (MB (n+1)) without asking for continuation verification from the searcher.

Besides choosing search fields for the search criteria, the searcher could also choose criteria such as a limit to the number of bridges he/she wishes the controller to search. Even the format of the Multi-bridge display could be customized. One searcher could request to have the result from every bridge search displayed and upon approval continue with the search. On the contrary, another searcher could choose to have all possible results from the limit of bridges to be displayed to him together.

Multi-Bridge display: As mentioned above, the results from the Multi-Bridge search will be displayed in a customized format revealing just enough information so as to discourage other online users from exploiting the services. The Multi-Bridge service is a great opportunity for online users who are involved in sales and marketing in their professional life. The service offers them a great opportunity to contact potential buyers using this network. This is good only if the buyer approves of it else it could create disharmony and discourage potential users from signing on the site. To counter this, the display through the Multi-Bridge search will mask information of individuals meeting the search criteria such as name and contact information. Instead, it shall provide the searcher a "found match" message, including the number of bridges involved in the networking and the person he/she should contact (in his/her personal network). The searcher will also be provided a unique alphanumeric string for every bridge that is to be crossed. The alphanumeric string will facilitate contacting the user forming the next bridge. For example consider the network between Dave and Eric. Eric based on his criteria received an output specifying 2 bridges between himself and Dave. Assume Ellen is the connecting individual between the 2 bridges. Now when Eric does the search he does not receive Dave's name. Instead, he receives a message identifying a positive search along with the information that there are 2 bridges to be crossed for the networking to take place along with Ellen's name and alphanumeric code (since she is on Eric's personal list) and the other alphanumeric code (in his case Dave's). Now Eric needs to provide the alphanumeric code to Ellen for Ellen to search her database. Upon receiving the alphanumeric code, Ellen knows that Eric is using her network and that he is interested in getting in touch with Dave. At this point Ellen may choose to provide the information or she could deny it based on her choice. This gives the system some degree of authenticity and protects it against individuals looking to exploit the service. A point to be noted is that the unique alphanumeric codes can be accessed only between individuals forming 1-bridge between them and having a level 2 and above access. In the above example, Eric would not find a positive match for Dave's alphanumeric code (since it is a 2-bridge network) but Ellen would (since it is 1-bridge and she has a level 2 and

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above access). To further explain the Multi-Bridge display, assume Eric did a search that resulted in a 3-bridge network involving Ellen, Dave and Dave's friend Sam. In this case Eric would receive a display that lists 3 bridges involved, Ellen's name along with the respective unique alphanumeric codes. Eric would only find a positive match for Ellen's alphanumeric code, Ellen would only find a match for Dave's alphanumeric code and Dave would only find a match for Sam's alphanumeric code. Well in the case of Dave, we have assumed that Ellen did not give him her alphanumeric code. If she did and she has given Dave a level 2 and above access, then Dave would also find a positive match for Ellen's code.

In yet another embodiment of the Multi-Bridge display, the results would be provided with time-bound alphanumeric codes for the individuals forming the bridges. By time-bound, the system would assign a unique alphanumeric codes for all the bridges forming a network (e.g. searcher ->Ellen ->Dave->Sam) that is active for a specific time period such as 1 week or 2 week. This would be more valuable over a permanent alphanumeric code for every individual since it would further protect the accouhts and privacy of every individual. By having the codes time-bound, it would ensure that some Internet miscreant not keep a record of the alphanumeric codes and publish them online. In this case, if the searcher did not get in touch with Sam for 2 weeks, the alphanumeric codes would expire and the searcher would have to perform the search again to receive the new time-bound alphanumeric codes. Once the codes expire any individual in the network would not find a match for the code(s).

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Object of the Invention

Accordingly the primary object of invention is to design and develop a novel Method of Professional Networking which is unique and which in effect would optimize networking among users.

It is also the object of the Invention to develop a system (methodology) for professional Networking, which in effect would optimize the networking among users.

It is also the object of the Invention to develop a methodology, which uses a secured system for an online Community.

It is also the object of the Invention to develop a methodology, which will allow the users extensive networking possibilities.

Further objectives of the invention will be clear from the following description.

Now the invention will be described in detail with reference to the drawings, which accompany this provisional specification. The objective of the description is to explain in detail the salient features of the invention. The nature of the invention and the manner in which it is to be performed is described in detail in the provisional specification.

Brief description of the drawings

Fig.1 illustrates by way of a block diagram the first embodiment of the present invention.
Fig. 2 is a block diagram showing the novel embodiment of the central controller incorporated in the apparatus.
Fig.3 is a block diagram showing the novel embodiment of the user interface incorporated in the apparatus.
Fig. 4 is a description of the sequence of search the central controller follows.
Fig. 5 is a block diagram showing how a 1-bridge search is made.
Fig. 6, 7 and 8 are block diagrams showing how a multi-bridge search is made.
Fig. 9 is a diagram of the multi-bridge display.

Detailed description of the invention

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The following description in detail describes various aspects of the invention as illustrated in the drawings. The method and apparatus of the present invention will now be discussed with reference to Fig. 1, 2,3 and 4. In a preferred embodiment, the present invention includes a user interface, a central controller and associated databases. Searcher provides search preference 100 to the central controller via searcher interface 300 and an Internet connection. Central controller 200 receives search preference 100 from the searcher, performs the necessary search in central controller 200, creates results display 110 and forwards back to the searcher interface 300. The searches are made with regard to the user's personal networks and are based on the level of access that the user is offered by the user's peers. Appropriate levels of access granted to the user by the user's peer, also allow the central controller to search the user's peers' network when required.

System Architecture.

The system architecture of a first embodiment of the apparatus and method of the present invention is illustrated with reference to Fig. 1, 2 and 3. As shown in **Fig.1, the apparatus of the present Invention** comprises searcher interface 300 and central controller 200 (collectively the "nodes"). Each node is connected via an Internet connection using a public switched phone network, such as those provided by a local or regional telephone operating company. Connection may also be provided by dedicated data line, cellular, Personal Communication Systems ("PCS"), microwave, or satellite networks. The user interface 300 is both the input and output gateways for communications with the central controller 200.

Using the above components, the present invention provides a method and apparatus to post search queries, perform a search for positive matches and list the results.

As shown in Fig.2, central controller 200 includes central processor (CPU) 205, cryptographic processor 210, RAM 215, ROM 220, operating system 240, network interface 245 and data storage device 250.

A conventional personal computer or computer workstation with sufficient memory and processing capability may be used as central controller 200. In one embodiment it operates as a web server, both receiving and transmitting searches received by the searcher interface 300. Central controller must be capable of high volume processing, performing a significant number of mathematical calculations in processing communications and database searches. A Pentium microprocessor such as the 100MHz P54C, commonly manufactured by Intel Inc., may be used for CPU 205. This processor employs a 32-bit architecture. Equivalent

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processors include the Motorola 120 MHz PowerPC 604 or Sun Microsystems 166 MHz Ultras ARC-1 or other faster processors developed from time to time.

An MC68HC16 microprocessor, commonly manufactured by Motorola Inc., may be used for cryptographic processor 210. Equivalent or superior processors developed from time to time may also be used. This microcontroller utilizes a 16-bit multiply-and-accumulate instruction in the 16MHz configuration and requires less than one second to perform a 512-bit RSA private key operation. Cryptographic processor 210 supports the authentication of communications from users. Cryptographic processor 210 may also be configured as a part of CPU 205. Other commercially available specialized cryptographic processors include VLSI Technology's 33MHz 6668 or Semaphore Communications' 40 Mhz Roadrunner284.

Data Storage device 250 may include hard disk magnetic or optical storage units, as well as CD-ROM drives or flash memory. Data storage device 250 contains databases used in the processing of searches used in the present invention, including user databases 255 containing user profiles and individual user networks along with the access levels granted by the individual users to their peers. In a preferred embodiment database software such as Oracle 7, manufactured by Oracle Corporation, is used to create and manage these databases. However other data management software such as directory servers or any other software that could support storage and retrieval of data at high speeds may be used instead.

User database 255 maintains data on users with fields such as name, address, phone number, username, electronic mail address, public/private key information, academic achievement information, personal networks and access levels to peers in the personal networks. This information is obtained when the searcher first registers with the site or when he/she is about to use the search service for the first time. The searcher will not be able to access the services of the 1-bridge and the multi-bridge search unless the searcher completes the mandatory information required to complete the individual's personal profile.

Network interface 245 is the gateway to communicate information to and from searchers with the central controller. The network interface connects the central controller with the searcher through the searcher interface 300. Conventional internal or external modems may serve as network interface 245. Network interface 245 supports modems at a range of baud rates from 1200 upward, but may combine such inputs into a T1 or T3 line if more bandwidth is required. In a preferred embodiment, network interface 245 is connected with the Internet and/or any of the commercial on-line services such as America Online, CompuServe, or Prodigy, allowing users to access a wide range of online connections. Several commercial

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electronic mail servers include the above functionality. NCD Software manufacturers "Post Office," a secure server-based electronic mail software package designed to link people and information over enterprise networks and the Internet. The product is platform independent and utilizes open standards based on Internet protocols. Searchers can exchange messages with enclosures such as filed, graphics, video and audio. The system also supports multiple languages. Alternatively, network interface 245 may be configured as a voice mail interface, web site, BBS, or electronic mail address.

While the above embodiment describes a single computer acting as central controller 200, those skilled in the art will realize that the functionality can be distributed over a plurality of computers. In one embodiment, central controller 200 is configured in a distributed architecture, wherein the database and processors are housed in separate units or locations. Some controllers perform the primary processing functions and contain a minimum RAM, ROM, and a general processor. Each of these controllers is attached to a WAN hub that serves as the primary communication link with the other controllers and the interface devices. The WAN hub may have minimal processing capability itself, serving primarily as a communications router. Those skilled in the art will appreciate that an almost unlimited number of controllers may be supported. This arrangement yields a more dynamic and flexible system, less prone to catastrophic hardware failures affecting the entire system.

FIG.3 describes a searcher interface. In an exemplary embodiment it is a conventional personal computer having an input device, such as a keyboard, mouse, or conventional voice recognition software package, a display device, such as a video monitor, a processing device such as a CPU; and a network interface such as a modem. These devices interface with the central controller 200. Alternatively, searcher interface 300 may also be voice mail systems, or other electronic or voice communications systems.

Referring now to FIG 3., there is described searcher interface 300 which includes central processor (CPU) 305, RAM 315, ROM 320, video driver 325, video monitor 330, communication port 340, input device 345, modem 350, and data storage device 360. Cryptographic processor 335 and biometric device 355 may be added for stronger authentication as described later. A Pentium microprocessor such as the 100 MHz P54C described above may be used for CPU 305.

If a cryptographic processor is required, the MC68HC 16 micro controller described above is used.

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a storage device 360 is a conventional magnetic-based hard disk storage unit such as ose manufactured by Conner Peripherals.

Online Embodiment

In the preferred embodiment of the present invention, communication between the searcher and the central controller takes place via electronic networks, with central controller 200 acting as a web server. The searcher logs on to central controller 200, creates search preference 100 and then enters it into the central controller 200. Central controller 200 performs the required search and creates results display 110 and forwards it to the searcher. The searcher then either logs out of the central controller or instructs the central controller to continue the search either by means of a new search preference 100 or a continuation of the current search preference 100.

Authentication of the searcher's identity involves central controller 200 extracting the searcher ID from the searcher preference 100 and looking up the searcher's identity in the searcher database 255.

With reference to **FIG 4**, we describe the **sequence of search the central controller 200 follows on search preference 100.** The central controller first performs a 1-bridge search where the controller searches the personal network of the searcher for any matches for search preference 100. The second search is for the multi-bridge 2 searches where the controller searches the networks of the searcher's peers for positive matches. Following this is the multi-bridge 3 searches where the controller searches the records of the peers of those individuals that were searched in multi-bridge 2. As such the controller searches using the sequence 1-bridge-> multi-bridge 2-> multi-bridge 3- > multi-bridge 4->...-> multi-bridge n ... where the controller searches the network of the peers searched in the previous multi-bridge search (n-1). In the case of this embodiment there are different requirements for the 1-bridge search and the multi-bridge searches. For the 1-bridge search, central controller 200 searches the personal contacts of those users that grant the searcher access to their personal and/or professional information. However in the case of multi- bridge searches, the central controller 200 looks for two different accesses. Firstly the users in the previous multi-bridge search grant their respective contact access to their network. And secondly users in the current multi-bridge that has granted their respective peer access to their personal and/or professional information. For example consider A->B->C->D. In this for an A->B, 1-bridge networking, central controller searches whether B has granted An access to his/her personal and/or professional information. In the case of C->D, the central controller checks first to see if C has granted B access to his/her network. If this requirement is met, central

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controller then checks to see if D has granted C access to his/her personal and/or private information. Only if both these criteria are met does the central controller perform the search on D's information. The 1-bridge and multi-bridge searches are explained in detail in the following pages.

With reference to **FIG5**, we describe the process the controller follows to perform a general **1-bridge search**. In the example we used the 5 levels of access security system that users grant their peers. Summaries of the levels are as outlined below.

Level 1: Public info (First name, Last name, Date of birth, City, State and Country of residence, masked email, Academic life summary including schools and colleges + degrees).
Level 2: Level 1 + Access to user's professional information (including history of employment)
Level 3: Level 2 + access to user's networks.
Level 4: Level 2 + access to user's private info (including family, hobbies, etc.)
Level 5: Level 4 + access to user's networks.

The central controller receives the search preference 100 and performs a "1-bridge" search within the searcher's personal networks. The central controller searches all the personal contacts of the searcher, and searches the personal and professional information of those individuals that have granted the searcher an appropriate level of access. This is called a 1-bridge search and the individuals whose information is searched as "1-bridge users". To further exemplify, consider searcher "I" with a network of "A", "B", "C", "D", and "E" all of which have granted permission to "I" to view their personal and/or professional information (level 2 and above access). Another individual "F" who is also in "I's" network has not granted "I" access to his personal and professional information. In the case of a 1-bridge search, central controller 200 will search the personal and professional information of "A", "B", "C", "D", and "E" (1-bridge users) for matches to search preference 100. However the controller will not search the information of "F" since the appropriate access was not granted to "I". If a positive match(s) is found, central controller 200 will create results display 110 and forward it to searcher interface 300. The searcher can then choose to either log out of the central controller or continue the search into the multi-bridges. If no matches were found in 1-bridge search, the central controller 200 continues into multi-bridge search. The 1-bridge search and the Fig 5 will be used in further illustrations to explain the process of the multi-bridge search. Assume the sequence of flow of search in FIG5 as **Sequence X**. Based on the different multi-bridge search, the variables I, A, B, C, D, E and F will vary and substitutes will be listed in each individual multi-bridge illustration.

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With reference to **FIG6**, we describe the multi-bridge2 search or **MB (2)**. As mentioned above, for a multi-bridge2 search to take place, two criteria need to be met for every user before a search takes place. First the "1-bridge users" should have granted the searcher access to their networks. And secondly, peers of these users should have given them appropriate level of access to their information. In the example we used the 5 levels of access security system that users grant their peers. Summaries of the levels are as outlined below.

Level 1: Public info (First name, Last name, Date of birth, City, State and Country of residence, masked email, Academic life summary including schools and colleges + degrees).
Level 2: Level 1 + Access to user's professional information (including history of employment)
Level 3: Level 2 + access to user's networks.
Level 4: Level 2 + access to user's private info (including family, hobbies, etc.)
Level 5: Level 4 + access to user's networks.

In this case, the central controller 200 views the personal network of the "1-bridge users" and checks for individuals that have granted the searcher access to their networks. The controller then searches these users networks for individuals that have granted them access to their personal and/or professional information. We call these individuals "mb2 users". The central controller 200 then performs a "1-bridge"search of the information of "mb2 users" for a match to search preference 100. To further exemplify assume in the example above that "A"(1-bridge user) provided access to the searcher to search his network with regard to the fields entered in search preference 100 (level 3 or level 5). Further assume that "AB", "AC", "AD", "AE" and "AF" are peers of user "A" and have granted him/her access to their information (level 2 and above). As such, "AB", "AC", "AD", "AE" and "AF" become "mb2 users". In this case the controller will perform a 1-bridge search on "AB", "AC", "AD", "AE" and "AF" for a positive match for search preference 100 and forward the results display 110 if required to searcher interface 300.

In Fig 6, there are instances where a 1-bridge **Sequence X** needs to be performed. In this case for each individual 1-bridge search, there is a box displaying the substitutes needed for variables in Sequence X. Consider for example "Perform sequence X for contacts of A". "Contacts of A" are mb2 users connected to A- in this case "AB", "AC", "AD", "AE" and "AF". In this instant, the figure requires the reader look up Fig. 5 to understand the process better. In fig 5, the reader firstly needs to substitute the existent variables A, B, C, D, E with

contacts of A and secondly replace I with A. and go through the process. Matches to sequence 100 will be added to the results display110.

This is termed multi-bridge2 because there are 2 bridges involved in the network- one from the searcher "I" to "A" and the other from "A" to "AB", "AC", "AD", "AE" and "AF" respectively. If no search is made in Multi-bridge2, the central controller moves on to multi-bridge3 search.

The display provided using the multi-bridge search is also unique to discourage searchers from misusing the services offered on the site. We have described the multi-bridge display later.

Assume the sequence of flow of search in Fig.6 as **Sequence Y**. Based on the different multi-bridge search, the variables I, A, B, C, D, E and F and substitutes to Sequence X will vary and substitutes will be listed in each individual multi-bridge illustration.

With reference to **FIG7**, we describe a **multi-bridge3 search or MB (3)**. In the example we used the 5 levels of access security system that users grant their peers. Summaries of the levels are as outlined below.

Level 1: Public info (First name, Last name, Date of birth, City, State and Country of residence, masked email, Academic life summary including schools and colleges + degrees).
Level 2: Level 1 + Access to user's professional information (including history of employment)
Level 3: Level 2 + access to user's networks.
Level 4: Level 2 + access to user's private info (including family, hobbies, etc.)
Level 5: Level 4 + access to user's networks.

In this case the controller first searches the information of the "MB2 users" searched to check if they have provided their respective "1-bridge user" with access to their respective networks. If so, the controller then searches the personal networks of these users for individuals that have granted these "MB2 users" access to their information. We call these individuals "mb3 users". The controller then searches the personal and professional information of these "mb3 users" for search preference 100 and forwards any matches to searcher interface 300, customized according to multi-bridge display as is described later. To carry on the example from the multi-bridge2, assume that "AB" (mb2 user) has granted "A" (1-bridge user) access to his/her networks (level 3 or 5) and "ABC" and "ABD" are peers

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"AB" that have granted them access to their information (level 2 and above). As in our method of example, "ABC" and "ABD" become "mb3 users". The controller searches the personal information of "ABC" and "ABD" and forwards the results display 110 to the searcher based on the multi-bridge display as is described later. If there are no results the controller moves on to the next multi-bridge search.

In Fig 7, there are instances where a MB2 **Sequence Y** needs to be performed. In this case for each individual MB2 search, there is a box displaying the substitutes needed for variables in Sequence Y and their respective substitutes for Sequence X since Sequence Y uses Sequence X. The reader will need to make the substitutions before studying Fig 5 and Fig 6 with respect to a MB3 scenario.

For example consider "Perform sequence Y and X for contacts of A". In this case the reader will need to substitute in Sequence Y, A, B, C, D, E for contacts of A which in this instant would be "AB", "AC", "AD", "AE" and "AF". Again in Sequence Y, the reader will need to substitute I for A. Further in Sequence X; the reader will need to substitute A, B, C, D, E and F for contacts (contacts of A). Contacts (contacts of A) are mb3 users connected through A- in this instant ABC and ABD. The reader in Sequence X will also need to substitute I for contacts of A – in this instant AB, AC, AD and AE. Once the reader makes these substitutions, he will have an accurate understanding of the process involved in a MB3 search. Results of matches will be added to Results Display 110.

As described in FIG6 and FIG 7, the multi-bridge search can extend to as many bridges as required (MB [n]). For an MB (n) search to take place two criteria need to be met (**Fig 8**):

1. All users that were searched in MB (n-1) should have granted their respective MB (n-2) users access to their networks (level 3 or 5)
2. Information of only those individuals of MB (n) shall be searched who grant permission to their respective MB (n-1) user access to their personal and/or professional information.
   (Level 2 and above)

For an MB (n) search to take place the controller 200 performs the search if 2 criteria are met.

1. All MB (n-2) users have given their **previous links** in the network access to their contacts- e.g. in Fig. 8, ABCD is a previous link of ABCDE, ABC is a previous link of ABCD, AB is a previous link of ABC, A is a previous link of AB and I is a previous link of A.

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2. All MB (n) users grant their previous link MB (n-1) user permission to their information.

Only after these two criteria are met will the controller search the information of the individuals qualified as MB (n) users. The controller shall search the personal and/or professional information of these MB (n) users for matches to search preference 100 and provide the results display 110 to searcher interface 300 based on the multi-bridge display as is described below.

For e.g. consider Fig. 8. Consider a MB search for ABCDE by I that involves 5 bridges. In this case n =5 and (n-1) = 4 In the example we used the 5 levels of access security system that users grant their peers. Summaries of the levels are as outlined below.

Level 1: Public info (First name, Last name, Date of birth, City, State and Country of residence, masked email, Academic life summary including schools and colleges + degrees).
Level 2: Level 1 + Access to user's professional information (including history of employment)
Level 3: Level 2 + access to user's networks.
Level 4: Level 2 + access to user's private info (including family, hobbies, etc.)
Level 5: Level 4 + access to user's networks.

According to the rules stated above, the controller will check to see if the users in MB (4) have granted their previous link access to their contacts (in this case level 3 or level 5). So, the controller shall check to verify the following network accesses.

ABCD -> ABC *(level 3 or 5?)*
ABC -> AB *(level 3 or 5?)*
AB -> A *(level 3 or 5?)*
A -> I *(level 3 or 5?)*

If the above are met, the controller will verify if ABCDE has granted permission to ABCD to access his/her personal information.

ABCDE -> ABCD (level 2 and above)

If all the above criteria are met, the controller shall search ABCDE's information based on Is search preference 100.

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In Fig9, we describe the **multi-bridge display**. To discourage searchers from exploiting the services offered by the multi-bridge search, the search results shall be restricted to a particular format. The results will neither display the name of the targeted individual, nor the names of the network of bridges that the searcher will need to go through to make the network. Instead the results will display the number of bridges that the searcher will need to use for the network and a unique alphanumeric multi-bridge code that would represent the identity of the different individuals involved in the network. The alphanumeric multi-bridge code is a unique string that will be assigned by the controller to every user on the site. The alphanumeric code is used to facilitate the individuals forming the network to identify the next bridge in the network and contact the respective individual. It should also be noted that positive matches for the alphanumeric code would only occur if the individual were on the personal network list of the user making the search. Let us take our example and assume search preference to be "industry = e-commerce" and "city = London" and assume a match for the network "I" -> "A" -> "AB" -> "ABC". In this case we have a Multi-Bridge 3 search. The display to the searcher will include all information that was searched for by the searcher including the number of bridges (e-commerce, London and 3 bridges) and three alphanumeric codes (assume abc1, abc2, abc3). These alphanumeric codes will be assigned only for the bridges that lead to match for search preference 100 during the search. Once again, we'd like to point that the result will not provide any information to the searcher that would help identify "AB" or "ABC" in this case. The method will require the searcher to get in touch with "A" to identify "AB" and then request "A" to request "AB" to get in touch with "ABC" and network. This is because, using the alphanumeric code, the searcher will only be able to find a positive match for abc1 ("A" in this case). Searches made by the searcher for abc2 and abc3 will lead to no results. The searcher will need to provide the codes abc2 and abc3 to "A" so that "A" could access "AB". "A" will find a positive match for abc2 but no match for abc3. "A" will need to get in touch will "AB" and provide "AB" with abc3. "AB" will find "ABC" by entering abc3 in his network search field. As such the network will be complete. "AB" would then need to get "ABC" to get in touch with either the searcher directly or via the individual bridges.

In yet another embodiment of the Multi-Bridge display, central controller 200 would provide results display 110 with time-bound alphanumeric codes for the individuals forming the bridges. By time-bound, the central controller would assign a unique alphanumeric code for two individuals forming a bridge (assume Searcher -> "A" -> "AB" -> "ABC") that is active for a specific time period such as 1 week or 2 week. This would be more valuable over a permanent alphanumeric code for every individual since it would further protect the accounts and privacy of every individual. By having the codes time-bound, it would ensure that some

miscreant user not keep a record of the alphanumeric codes and publish them online. In this case, if the searcher did not contact ABC within 2 weeks, the alphanumeric codes would expire and the searcher would have to perform the search again to receive the new time-bound alphanumeric codes and provide them through the bridges.

It is to be noted that we have been refrained from using the user identification (user id) from the search since the "user id" sometimes reveals the individuals names and may become the reason for solicitation.

It is also to be noted that the basic objective of the description is to explain the salient feature of the invention.

It is to be further noted that within the scope and ambit of the invention various modifications and amendments are permissible.

Dated this 11th day of July 2000

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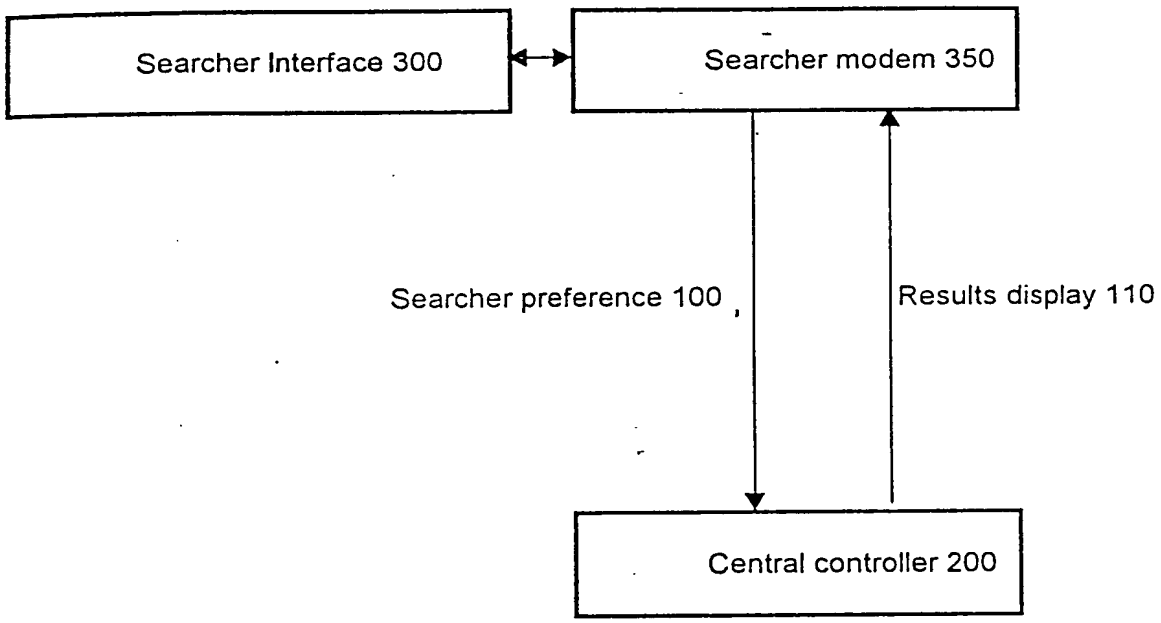

Fig.1 illustrates a first embodiment of the present invention.

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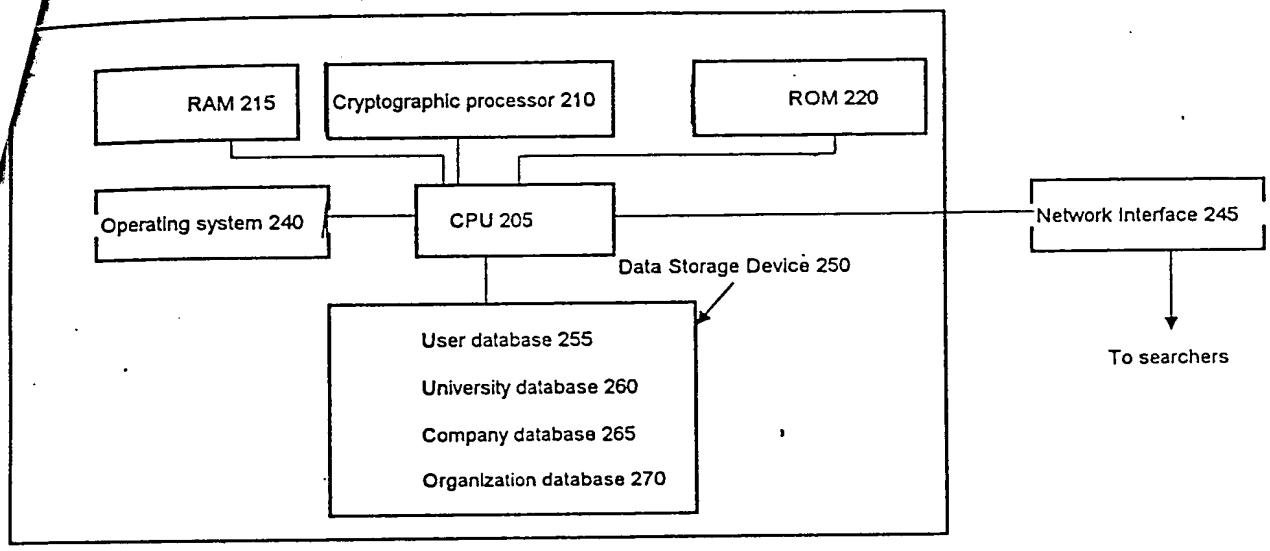

Fig. 2 is a block diagram showing one embodiment of the central controller.

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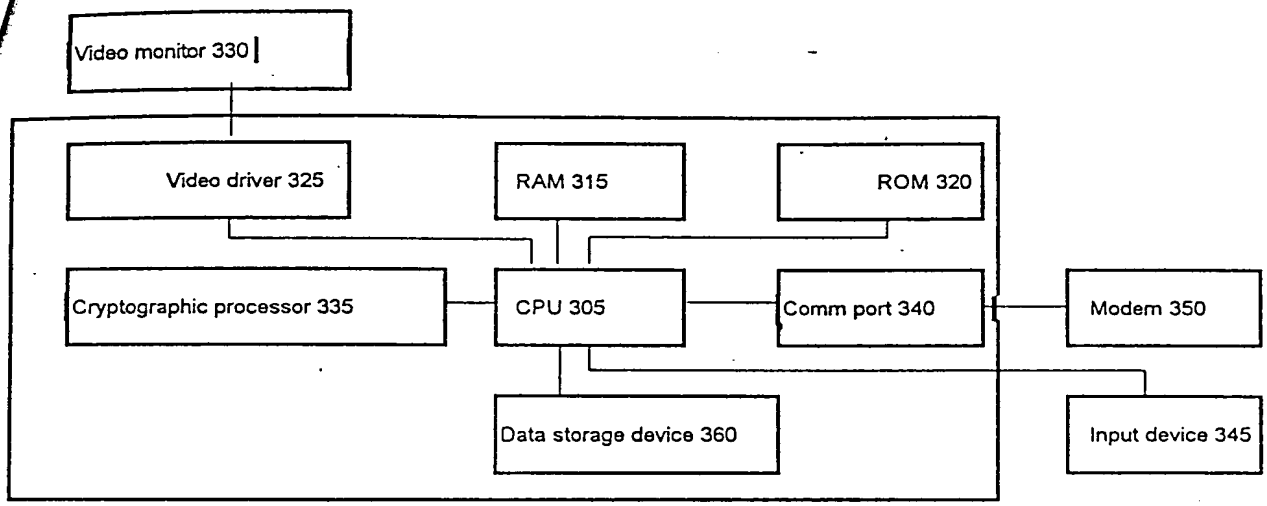

Fig.3 is a block diagram showing one embodiment of the user interface.

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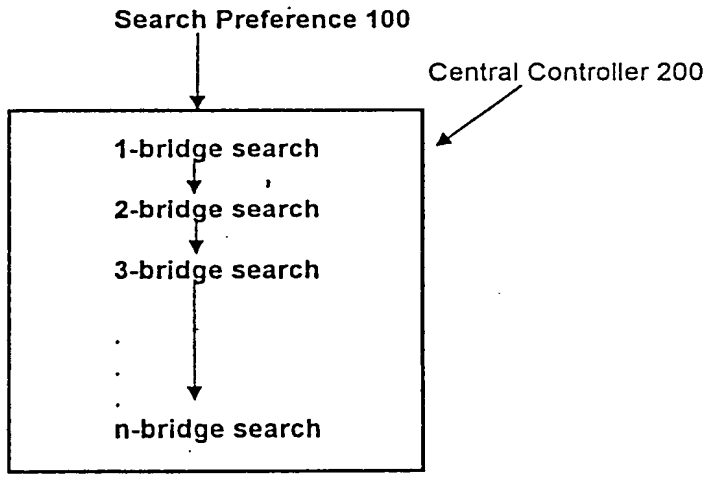

Fig. 4 is a description of the sequence of search the central controller follows.

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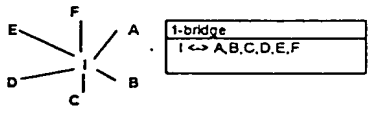

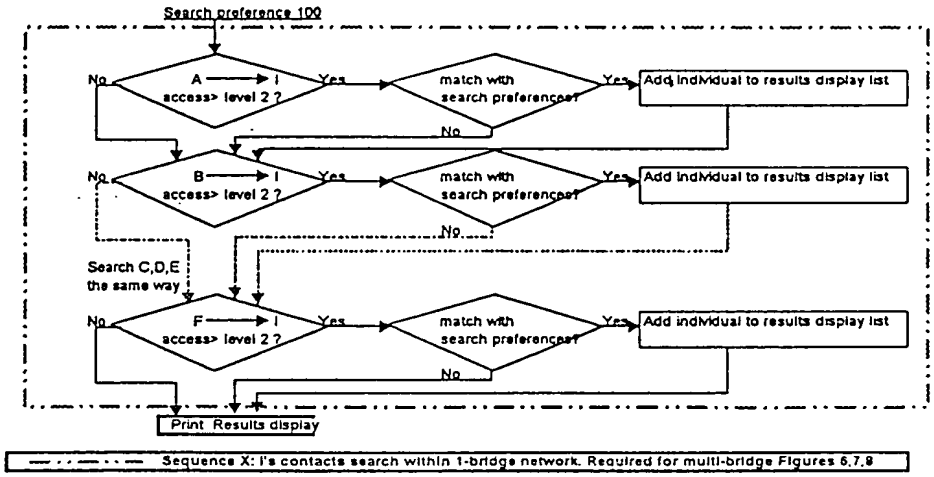

Fig. 5 is a block diagram showing how a 1-bridge search is made.

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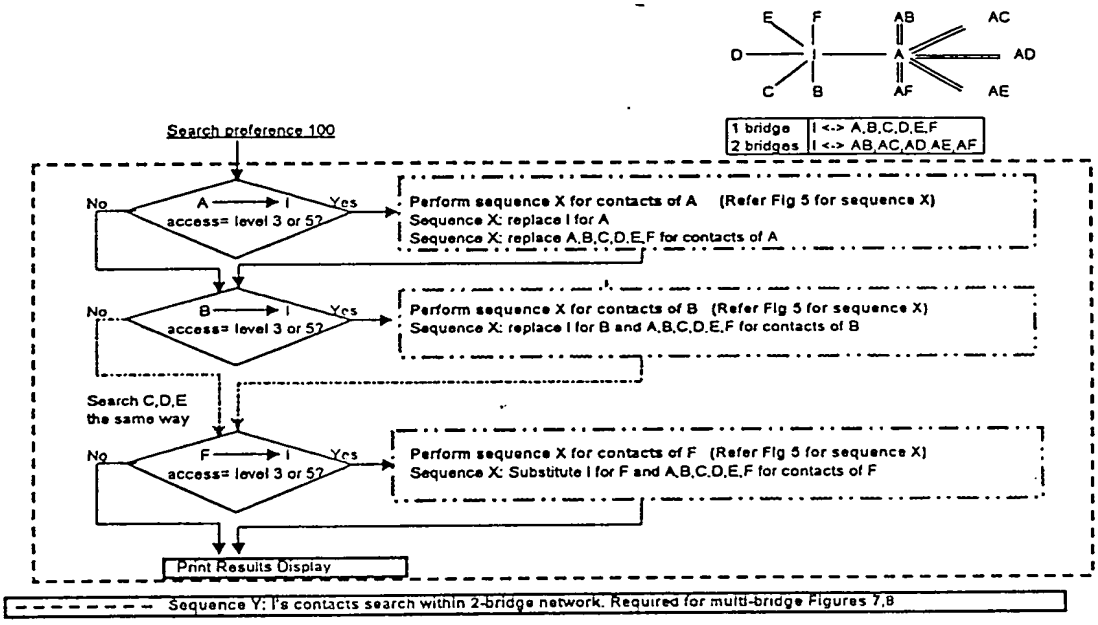

Fig. 6 is a block diagram showing how a multi-bridge2 search is made.

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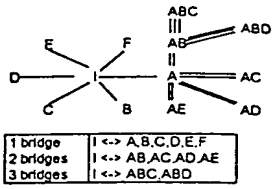

1 bridge	I <-> A,B,C,D,E,F
2 bridges	I <-> AB,AC,AD,AE
3 bridges	I <-> ABC,ABD

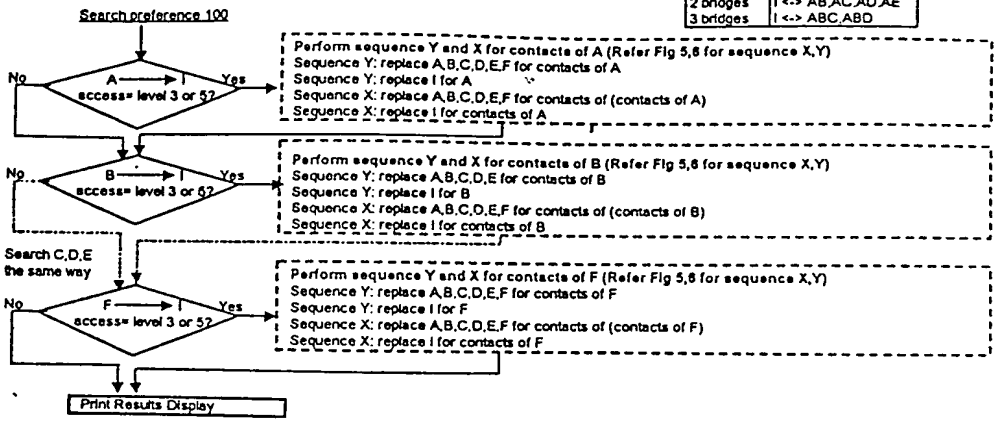

Fig.7 is a block diagram showing how a multi-bridge3 search is made.

Dated this 11th day of July 2000

Signature of the Applicant

Amit Jaipuria

Pradeep Jaipuria

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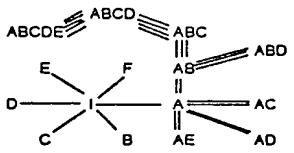

1 bridge	I <-> A,B,C,D,E,F
2 bridges	I <-> AB,AC,AD,AE
3 bridges	I <-> ABC, ABD
4 bridges	I <-> ABCD
5 bridges	I <-> ABCDE

Fig.8 is a general diagram for an Multiple multi-bridge search or MB(n)

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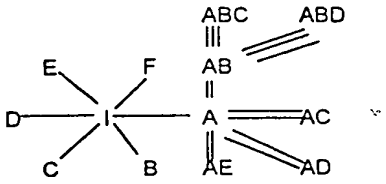

Display to I

1 match found within 3 bridges (in this example)

Industry	City	Name	Alphanumeric code
E-commerce	London	A	abc1
		?	abc2
		?	abc3

Fig 9: an example of a multi-bridge display

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Amit Jaipuria

Pradeep Jaipuria

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